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L6 same (pyruvic acid)

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*DB=USPT,PGPB,JPAB,EPAB,DWPI;
PLUR=YES; OP=ADJ*

L7 L6 same (pyruvic acid) 11 L7

L6 L3 same (synthes\$\$\$\$\$ or
biosynthes\$\$\$\$\$) 577 L6

L5 L3 and (synthes\$\$\$\$\$ or
biosynthes\$\$\$\$\$) 2147 L5

L4 L3 and (pyruvate or pyruvic acid) 354 L4

L3 (sialic acid) or (NANA) or
(N-acetylneuraminic acid) 4418 L3

DB=DWPI; PLUR=YES; OP=ADJ

L2 (sialic acdd) or (NANA) or
(N-acetylneuraminic acid) 245 L2

L1 (sialic aicd) or (NANA) or
(N-acetylneuraminic acid) 245 L1

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L7: Entry 1 of 11

File: USPT

Mar 12, 2002

DOCUMENT-IDENTIFIER: US 6355453 B1

TITLE: Method for making fluorinated sugars having a side chain and use thereof

Brief Summary Paragraph Right (11):

The biosynthesis of Neu5Ac is enzyme-catalyzed and would appear to provide a model for a quick synthesis. In the biosynthesis, ManNAc is reacted with the pyruvate (pyruvic acid, CH.sub.3 --CO--COOH), and the enzyme catalyst is N-acetylneuraminic acid aldolase. N-acetylneuraminic acid aldolase EC 4.1.3.3 can be found in animal tissue and some bacteria. This enzyme has also been produced by biotechnology methods involving common microorganisms such as E. coli. The natural sialic acid Neu5Ac has been made successfully by enzymatic synthesis, but the preparation of Neu5Ac derivatives (particularly Neu5Ac3F) is more problematic.

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L7: Entry 2 of 11

File: USPT

Jan 2, 2001

DOCUMENT-IDENTIFIER: US 6168934 B1

TITLE: Oligosaccharide enzyme substrates and inhibitors: methods and compositions

Detailed Description Paragraph Right (201):

Two procedures have been combined to synthesize a sialyl trisaccharide. The enzymatic aldol reaction (cycle B in Scheme 2) was first introduced to the Scheme 1: ManNAc was converted to NeuAc catalyzed by NeuAc aldolase (EC 4.1.3.3) in the presence of pyruvic acid. Although NeuAc aldolase also catalyzes the reverse reaction (NeuAc to ManNAc and pyruvate), the produced NeuAc is irreversibly incorporated into cycle A of Scheme 2 via CMP-NeuAc catalyzed by CMP-sialic acid synthetase coupled with inorganic pyrophosphatase (PPase)-catalyzed decomposition of the released inorganic pyrophosphate. The sialyl LacNAc was obtained in 89 percent yield after a Bio-Gel P-2 column chromatography. The experimental procedure is as follows:

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L7: Entry 3 of 11

File: USPT

Nov 30, 1999

DOCUMENT-IDENTIFIER: US 5994105 A

TITLE: Epimerase

Brief Summary Paragraph Right (3):

In recent years, N-acetylneuraminic acid is noted as raw materials of drugs. It is known that said N-acetylneuraminic acid may be enzymatically synthesized from N-acetylmannosamine and pyruvic acid using N-acetylneuraminic acid lyase. However, because of expensiveness and difficulty of large-scale preparation of N-acetylmannosamine, a method for preparing N-acetylneuraminic acid by reacting inexpensive N-acetylglucosamine and pyruvic acid in the presence of N-acetylneuraminic acid lyase is proposed (Udo Kragl et al., Angewandte Chemi-International Edition in English, 30, 827-828 (1991)). This method utilizes that acylglucosamine 2-epimerase epimerizes N-acetyl-glucosamine to N-acetylmannosamine. However, acylglucosamine 2-epimerase employed in this method exists only in a trace amount in animal tissues and techniques of large-scale production thereof has not been developed. Accordingly, above-mentioned method may not be employed practically.

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L7: Entry 10 of 11

File: USPT

Dec 10, 1991

DOCUMENT-IDENTIFIER: US 5071750 A

TITLE: Enzymatic process for preparing N-acetylneuraminic acid

Brief Summary Paragraph Right (4):

The enzymatic synthesis of Neu5Ac from N-acetyl-mannosamine and pyruvic acid (hereinafter abbreviated as ManNAc and Pyr, respectively) has been known since the 1960s (Comb et al., J. Biol. Chem. 235: 2529-2537 (1960)). The enzyme used is N-acetylneuraminic acid pyruvate lyase (E.C. 4.1.3.3), hereinafter referred to as lyase. During this process the following reaction takes place: ##STR1##

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L7: Entry 11 of 11

File: JPAB

May 14, 1996

DOCUMENT-IDENTIFIER: JP 08119986 A

TITLE: METHOD FOR PURIFYING SIALIC ACID OR ITS ANALOG

Abstract (2):

CONSTITUTION: A solution containing sialic acid or its analog obtained by synthesizing N-acetylneuraminic acid by condensing N-acetylmannosamine with pyruvic acid in the presence of sialic aldolase is concentrated by using an evaporator. The concentrated solution is mixed with a 2-3C organic aid (e.g. acetic acid) to make its concentration $\geq 80\%$ (V/V). The concentrated solution is dissolved in a water bath at 50°C while stirring to make the concentration of sialic acid or its analog $\geq 3\%$ (W/V). The solution is allowed to stand at 4°C to precipitate white crystal of sialic acid or its analog. Then the crystal is filtered to purify a large amount of sialic acid or its analog inexpensively, simply and efficiently.